

and water;

- (b) wherein the polymer - (1) contains ester groups and free carboxylic acid groups, (2) is partially solubilized due to the action of the base, and (3) has a solubilization pH greater than about pH 5.5;
- (c) wherein the mixture's pH is less than the polymer's solubilization pH; and
- (d) drying the mixture to produce a pesticidal matrix.

37 A process as described in Claim 36, wherein:

- (a) in the mixture, after the base and the polymer's acid groups have interacted, less than about 10% of the acid groups have been converted to salts.

38 A process as described in Claim 37, wherein:

- (a) the polymer is essentially insoluble below about pH 5.5.

39 A process as described in Claim 38, wherein:

- (a) the polymer is soluble above about pH 7.

40 A process as described in Claim 39, wherein:

- (a) the base is present in an amount less than that required to fully solubilize the polymer.

41 A process as described in Claim 40, wherein:

- (a) the base is a hydroxide compound.

42 A process as described in Claim 41, wherein:

- (a) the compound is selected from the group consisting of

ammonium hydroxide, an alkali metal hydroxide, an alkaline earth metal hydroxide, and mixtures thereof.

- 43 A process as described in Claim 42, wherein:
- (a) the compound is ammonium hydroxide.
- 44 A process as described in Claim 36, wherein:
- (a) the mixture does not contain the plasticizer, the ultraviolet protector, the activity enhancer, and the glidant.
- 45 A process as described in Claim 36, wherein:
- (a) the mixture contains the plasticizer.
- 46 A process as described in Claim 36, wherein:
- (a) the mixture contains the ultraviolet protector.
- 47 A process as described in Claim 36, wherein:
- (a) the mixture contains the activity enhancer.
- 48 A process as described in Claim 36, wherein:
- (a) the mixture contains the glidant.
- 49 A process as described in Claim 36, wherein:
- (a) the mixture contains the plasticizer and the ultraviolet protector.
- 50 A process as described in Claim 36, wherein:
- (a) the mixture contains the plasticizer and the activity enhancer.
- 51 A process as described in Claim 36, wherein:
- (a) the mixture contains the plasticizer and the glidant.

- 52 A process as described in Claim 36, wherein:
- (a) the mixture contains the ultraviolet protector and the activity enhancer.
- 53 A process as described in Claim 36, wherein:
- (a) the mixture contains the ultraviolet protector and the glidant.
- 54 A process as described in Claim 36, wherein:
- (a) the mixture contains the activity enhancer and the glidant.
- 55 A process as described in Claim 36, wherein:
- (a) the mixture contains the plasticizer, the ultraviolet protector, and the activity enhancer.
- 56 A process as described in Claim 36, wherein:
- (a) the mixture contains the ultraviolet protector, the activity enhancer, and the glidant.
- 57 A process as described in Claim 36, wherein:
- (a) the mixture contains the plasticizer, the activity enhancer, and the glidant.
- 58 A process as described in Claim 36, wherein:
- (a) the mixture contains the plasticizer, the ultraviolet protector, and the glidant.
- 59 A process as described in Claim 36, wherein:
- (a) the mixture contains the plasticizer, the ultraviolet protector, the activity enhancer, and the glidant.

60 A process as described in Claim 36, wherein:

- (a) the pesticidal agent is selected from the group consisting of an insecticide, an acaricide, a nematocide, a fungicide, a herbicide, and mixtures thereof.

61 A process as described in Claim 60, wherein:

- (a) the pesticidal agent is an insecticide selected from the group consisting of a chemical insecticide, a biological insecticide, and mixtures thereof.

62 A process as described in Claim 61, wherein:

- (a) the insecticide is a chemical insecticide.

63 A process as described in Claim 61, wherein:

- (a) the insecticide is a biological insecticide.

64 A process as described in Claim 63, wherein:

- (a) the biological insecticide is a naturally-occurring or a genetically-modified variety of an insect biological control agent.

65 A process as described in Claim 64, wherein:

- (a) the insect biological control agent is selected from the group consisting of a viral pathogen, a bacterial pathogen, a fungal pathogen, and mixtures thereof.

66 A process as described in Claim 65, wherein:

- (a) the insect biological control agent is a viral pathogen selected from the group consisting of a DNA

virus, a RNA virus, an unclassified insect virus, and mixtures thereof.

67 A process as described in Claim 66, wherein:

- (a) the viral pathogen is a DNA virus selected from the group consisting of a double stranded enveloped DNA virus, a double stranded nonenveloped DNA virus, a single stranded DNA virus, and mixtures thereof.

68 A process as described in Claim 67, wherein:

- (a) the DNA virus is a double stranded enveloped DNA virus selected from the group consisting of *Entomopoxvirinae* and *Eubaculovirinae*.

69 A process as described in Claim 68, wherein:

- (a) the double stranded enveloped DNA virus is *Entomopoxvirinae*.

70 A process as described in Claim 69, wherein:

- (a) the double stranded enveloped DNA virus *Entomopoxvirinae* is an entomopox virus (EPV) selected from the group consisting of *Melolontha melolontha* EPV, *Amsacta moorei* EPV, *Locusta migratoria* EPV, *Melanoplus sanguinipes* EPV, *Schistocerca gregaria* EPV, *Aedes aegypti* EPV, *Chironomus luridus* EPV, and mixtures thereof.

71 A process as described in Claim 68, wherein:

- (a) the double stranded enveloped DNA virus is

*Eubaculovirinae.*

72 A process as described in Claim 71, wherein:

- (a) the double stranded enveloped DNA virus *Eubaculovirinae* is selected from the group consisting of:
- (1) a nuclear polyhedrosis virus (NPV) of *Lymantria dispar* NPV, *Anagrapha falcifera* NPV, *Spodoptera littoralis* NPV, *Mamestra brassicae* NPV, *Choristoneura fumiferana* NPV, *Trichoplusia ni* NPV, *Heliocoverpa zea* NPV, *Rachiplusia ou* NPV, an *Autographa californica* NPV selected from the group consisting of V8vEGTDEL, V8vEGTDEL-AaIT, AcMNPV E2, AcMNPV L1, AcMNPV V8, AcMNPV Px1, and mixtures thereof; and
- (2) a granulosis virus (GV) of *Cydia pomonella* GV, *Pieris brassicae* GV, *Trichoplusia ni* GV, *Artogeia rapae* GV, *Plodia interpunctella* GV, and mixtures thereof.

73 A process as described in Claim 67, wherein:

- (a) the DNA virus is a double stranded nonenveloped DNA virus.

74 A process as described in Claim 67, wherein:

- (a) the DNA virus is a single stranded noneveloped DNA virus.

75 A process as described in Claim 66, wherein:

- (a) the viral pathogen is a RNA virus selected from the

group consisting of a double stranded enveloped RNA virus, a double stranded nonenveloped RNA virus, a single stranded RNA virus, and mixtures thereof.

76 A process as described in Claim 75, wherein:

- (a) the RNA virus is a double stranded enveloped RNA virus selected from the group consisting of *Togaviridae*, *Bunyaviridae*, *Flaviviridae*, and mixtures thereof.

77 A process as described in Claim 75, wherein:

- (a) the RNA virus is a double stranded nonenveloped RNA virus selected from the group consisting of *Reoviridae*, *Birnaviridae*, and mixtures thereof.

78 A process as described in Claim 75, wherein:

- (a) the RNA virus is a single stranded nonenveloped RNA virus selected from the group consisting of *Picornaviridae*, *Tetraviridae*, *Nodaviridae*, and mixtures thereof.

79 A process as described in Claim 65, wherein:

- (a) the insect biological control agent is a bacterial pathogen selected from the group consisting of *Bacillus thuringiensis*, *Bacillus lentimorbus*, *Bacillus cereus*, *Bacillus popilliae*, *Photobacterium luminescens*, *Xenorhabdus nematophilus*, and mixtures thereof.

80 A process as described in Claim 65, wherein the insect biological control agent is a fungal pathogen selected from

the group consisting of *Beauveria bassiana*, *Entomophthora* spp., *Metarrhizium anisopliae*, and mixtures thereof.

81 A process as described in Claim 36, wherein:

- (a) the polymer is selected from the group consisting of an ethyl acrylate/methacrylic acid copolymer, a methyl methacrylate/methacrylic acid copolymer, a methacrylic acid/methyl acrylate/methyl methacrylate copolymer, and mixtures thereof;
- (b) the plasticizer is selected from the group consisting of a poly(ethylene glycol), a poly(propylene glycol), a citric acid ester, diethyl phthalate, dibutyl phthalate, castor oil, triacetin, and mixtures thereof;
- (c) the ultraviolet protector is selected from the group consisting of carbon black, a benzophenone, a dye, titanium dioxide, and mixtures thereof;
- (d) the activity enhancer is a stilbene compound; and
- (e) the glidant is selected from the group consisting of talc, magnesium stearate, calcium stearate, calcium sulfate, and mixtures thereof.

82 A process as described in Claim 36, wherein:

- (a) the polymer is selected from the group consisting of an ethyl acrylate/methacrylic acid copolymer having free carboxylic acid groups and ester groups in a



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ration of about 1:1, a methyl methacrylate/methacrylic acid copolymer having free carboxylic acid groups and ester groups in a ratio of from about 1:1 to about 1:2, a methacrylic acid/methyl acrylate/methyl methacrylate copolymer having monomers in a ratio of from about 1:5:2 to about 3:7:3, and mixtures thereof;

(b) the plasticizer is selected from the group consisting of triethyl citrate and a poly(ethylene glycol) having an average molecular weight of about 1,000 to 10,000; and

(c) the stilbene compound is selected from the group consisting of Blancophor BBH, Calcofluor White M2R, Phorwite AR, and mixtures thereof.

83 A process as described in Claim 36, wherein:

(a) the polymer is a methyl methacrylate/methacrylic acid copolymer.

84 A process as described in Claim 36, wherein:

(a) the mixture is spray dried.

85 A process as described in Claim 36, wherein:

(a) the matrix has a particle size of less than about 20  $\mu\text{m}$ .

86 A process as described in Claim 58, wherein:

(a) the matrix has a particle size of from about 2  $\mu\text{m}$  to about 10  $\mu\text{m}$ .

87 A process as described in Claim 36, wherein:

- (a) the matrix comprises, on a percentage-weight-basis, from about 1% to about 50% of the pesticidal agent, from about 5% to about 50% of the polymer, from about 0% to about 25% of the plasticizer, from about 0% to about 30% of the ultraviolet protector, from about 0% to about 75% of the activity enhancer, and from about 0% to about 15% of the glidant.

88 A pesticidal matrix comprising:

- (a) on a percentage-weight-basis, from about 1% to about 50% of a pesticidal agent, from about 5% to about 50% of a pH-dependent polymer, from about 0% to about 25% of a plasticizer, from about 0% to about 30% of a ultraviolet protector, from about 0% to about 75% of a activity enhancer, and from about 0% to about 15% of a glidant; and
- (b) wherein the polymer - (1) contains ester groups and free carboxylic acid groups, (2) is partially solubilized due to the action of the base, and (3) has a solubilization pH greater than about pH 5.5.

89 A pesticidal matrix as described in Claim 88, wherein:

- (a) the matrix comprises, on a percentage-weight-basis, from about 5% to about 35% of the pesticidal agent, from about 10% to about 45% of the polymer, from about

0% to about 25% of the plasticizer, from about 0% to about 20% of the ultraviolet protector, from about 0% to about 45% of the activity enhancer, and from about 0% to about 10% of the glidant.

90 A pesticidal matrix as described in Claim 88, wherein:

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- (a) the polymer is selected from the group consisting of an ethyl acrylate/methacrylic acid copolymer, a methyl methacrylate/methacrylic acid copolymer, a methacrylic acid/methyl acrylate/methyl methacrylate copolymer, and mixtures thereof;
  - (b) the plasticizer is selected from the group consisting of a poly(ethylene glycol), a poly(propylene glycol), a citric acid ester, diethyl phthalate, dibutyl phthalate, castor oil, triacetin, and mixtures thereof;
  - (c) the ultraviolet protector is selected from the group consisting of carbon black, a benzophenone, a dye, titanium dioxide, and mixtures thereof;
  - (d) the activity enhancer is a stilbene compound; and
  - (e) the glidant is selected from the group consisting of talc, magnesium stearate, calcium stearate, calcium sulfate, and mixtures thereof.

91 A pesticidal matrix as described in Claim 90, wherein:

- (a) the polymer is selected from the group consisting of

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*cont*  
*201*
- an ethyl acrylate/methacrylic acid copolymer having free carboxylic acid groups and ester groups in a ration of about 1:1, a methyl methacrylate/methacrylic acid copolymer having free carboxylic acid groups and ester groups in a ratio of from about 1:1 to about 1:2, a methacrylic acid/methyl acrylate/methyl methacrylate copolymer having monomers in a ratio of from about 1:5:2 to about 3:7:3, and mixtures thereof;
- (b) the plasticizer is selected from the group consisting of triethyl citrate and a poly(ethylene glycol) having an average molecular weight of about 1,000 to 10,000; and
- sub*  
*201*  
*cont*
- (c) the stilbene compound is selected from the group consisting of Blancophor BBH, Calcofluor White M2R, Phorwite AR, and mixtures thereof.

92 A pesticidal matrix as described in Claim 88, wherein:

- (a) the pesticidal agent is selected from the group consisting of an insecticide, an acaricide, a nematocide, a fungicide, a herbicide, and mixtures thereof.

93 A pesticidal matrix as described in Claim 92, wherein:

- (a) the pesticidal agent is an insecticide selected from the group consisting of a chemical insecticide, a biological insecticide, and mixtures thereof.

94 A pesticidal matrix as described in Claim 93, wherein:

(a) the insecticide is a chemical insecticide.

95 A pesticidal matrix as described in Claim 93, wherein:

(a) the insecticide is a biological insecticide selected from the group consisting of a viral pathogen, a bacterial pathogen, a fungal pathogen, and mixtures thereof.

96 A pesticidal matrix as described in Claim 95, wherein:

(a) the biological insecticide is selected from the group consisting of:

- (1) *Melolontha melolontha* EPV, *Amsacta moorei* EPB, *Locusta migratoria* EPV, *Melanoplus sanguinipes* EPV, *Schistocerca gregaria* EPV, *Aedes aegypti* EPV, *Chironomus luridus* EPV, and mixtures thereof;
- (2) *Lymantria dispar* NPV, *Anagrapha falcifera* NPV, *Spodoptera littoralis* NPV, *Mamestra brassicae* NPV, *Choristoneura fumiferana* NPV, *Trichoplusia ni* NPV, *Helicoverpa zea* NPV, *Rachiplusia ou* NPV, an *Autographa californica* NPV selected from the group consisting of V8vEFTDEL, V8vEGTDEL-AaIT, AcMNPV E2, AcMNPV L1, AcMNPV V8, AcMNPV Px1, and mixtures thereof;
- (3) *Cydia pomonella* GV, *Pieris brassicae* GV, *Trichoplusia ni* GV, *Artogeia rapae* GV, *Plodia interpunctella* GV,

and mixtures thereof;

- (4) *Togaviridae*, *Bunyaviridae*, *Flaviviridae*, and mixtures thereof;
- (5) *Reoviridae*, *Birnaviridae*, and mixtures thereof;
- (6) *Picornaviridae*, *Tetraviridae*, *Nodaviridae*, and mixtures thereof;
- (7) *Bacillus thuringiensis*, *Bacillus lentimorbus*, *Bacillus cereus*, *Bacillus popilliae*, *Photobhabdus luminescens*, *Xenorhabdus nematophilus*, and mixtures thereof; and
- (8) *Beauveria bassiana*, *Entomophthora* spp., *Metarrhizium anisopliae*, and mixtures thereof.

97 A pesticidal matrix produced by a process as described in Claim 1.

98 A process for improving the residual control of a pest comprising:

- (a) applying to the locus of the pest a pesticidally-effective amount of a pesticidal matrix as described in Claim 97.

Remarks

General & Specific Fee Authorizations

Under 37 C.F.R. § 1.25(b), the Commissioner is authorized to charge (or credit) to USPTO Deposit Account No. 01-1300 any and all fees (or refunds) arising under 37 C.F.R. §§ 1.16-1.18 relating to the present application. Applicants note that all